PROJECT FACT SHEET

CONTRACT TITLE: An Integrated Study of the Grayburg/San Andres Reservoir, Foster and South Cowden Fields, Ector County, Texas -- Class II

ID NUMBER: DE-FC22-93BC14982

B&R CODE: AC1010000

CONTRACTOR: Laguna Petroleum Corp.

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PROJECT SITE
CITY: Midland **STATE:** TX
CITY: Foster Field (Ector Co) **STATE:** TX
CITY: S Cowden Field (Ector Co) **STATE:**

CONTRACT PERFORMANCE PERIOD:
8/2/1994 to 8/2/2000

PROGRAM: Field Demonstrations
RESEARCH AREA: Seismic/Class 2
PRODUCT LINE: ADIS

FUNDING (1000'S)	DOE	CONTRACTOR	TOTAL
PRIOR FISCAL YRS	1452	1848	3300
FY 2001 CURRENT OBLIGATIONS	0	0	0
FUTURE FUNDS	0	0	0
TOTAL EST'D FUNDS	1452	1848	3300

OBJECTIVE: Address production problems typically associated with shallow shelf carbonate reservoirs. This project will demonstrate that 3-D seismic data can be used to aid in identifying porosity zones, permeability barriers, and thief zones and thereby improve waterflood design.

March 2001

PROJECT DESCRIPTION:

Background: Reservoirs in the Foster and South Cowden fields were approaching economic limit and the 68 year old lease would be abandoned within 10 years. A multi-disciplinary approach to waterflood design and implementation, along with selective infill drilling and deepening is planned to increase reserves, extend reservoir life, and improve production. Reservoir characterization can be improved by integrating seismic derived reservoir properties, geological characterization techniques, and 3-D reservoir simulation. Additionally, with the advent of low cost state-of-the-art computer hardware and software packages, independent operators can economically afford a similar development effort.

Work to be Performed: The 3-D seismic data are inverted to remove the seismic wavelet, producing log-like traces that have a direct relationship (and theoretical basis) with carbonate rock porosity. Integrated with existing geological and reservoir engineering data, these data identify porosity trends, permeability barriers, and potential channels to improve enhanced recover design. Reservoir simulation will then be used to determine infill drilling potential and the optimum waterflood design for the project area.

PROJECT STATUS:

Current Work: Project completed August 2, 2000. Final report in progress.

Scheduled Milestones:

Complete final report 09/99

Accomplishments: (1) 3-D seismic data were inverted to remove the seismic wavelet, producing log-like traces that have a direct relationship with carbonate rock porosity. Seismic derived porosity maps used in conjunction with a modified production history has lead to a program of plug-backs, re-stimulations and new well drilling during 1998-99. (2) 570,000 new reserves identified by seismic survey and new interpretation techniques. (3) Improved "pipeline Frac" in Wicher #2 produced 12,000 bbl in 1997. (4) Tests show that improved Frac does not penetrate the San Andres and prevents water influx into the producing Grayburg intervals. Operator savings of $30,000 per well realized by not penetrating the San Andres reservoir. (5) Lease production has increased 60%. Initial production risen from 120 BOPD to 320 BOPD. (6) Cost-effective seismic techniques estimated at only $0.20 per barrel of added reserves. (7) Redesign of waterflood to concentrate on Upper Grayburg and not penetrate the San Andres. (8) Incremental production to September 2000 is 190,000 barrels of oil with an estimated 2.5 million barrels of incremental reserves. (9) The Foster-Peque # 8 was fraced in 1998 and treated with 25, 174 gallons of cross-linked gel; and 118,580 pounds of 16/30 sand. Production rates prior to stimulation were 2 BOPD, 15 BWPD. After the frac and stimulation the well had stabilized at 22 BOPD, 450 BWPD and held for over 60 days with no indication of decline. (10) Cost-effective testing of wells has improved the selection of good recompletion candidates.